REMARKS/ARGUMENTS

Claim rejections – 35 U.S.C. 103(a)

Claims 1, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al (US 6,480528) in view of Chang et al (US 2004/0146091).

Response

The claimed invention presents a method utilized in a receiver of a multiple–antenna system, and the method is of automatic gain control for multiple OFDM modules receiving data on a single frequency band. The method includes measuring RMS powers of a first group of symbols received at the receiver antennas, determining candidate powers in different ways, such as RMS calculation, arithmetic mean, and geometric mean, and once all candidate powers being determined, selecting one of the candidate powers according to a predetermined rule and setting the gain of the receiver amplifiers.

Patel discloses a receiver of a single-antenna system. The receiver receives multi-carrier signals and filters the signal into sub-carriers. Each of the sub-carriers is sent to a corresponding matched filter unit for matched filtering. A variable gain amplifier (VGA) in each of the matched filter unit provides a gain of the filtered signal and is controlled by an AGC (Automatic Gain Control) circuit.

As to claim 1, the examiner alleged that Patel teaches a method for automatic gain control (AGC) in a receiver of an antenna system comprising a plurality of modules having a receiver antenna for substantially simultaneously receiving a plurality of signals via a single frequency band, the method comprising: amplifying the plurality of received signals with at least an amplifier (see fig. 2, numbers 224a, 224b, 224c, col. 4, lines 56-67, col. 5, lines 1-8); generating a plurality of time domain samples of the amplified signals

with at least an analog-to-digital converter (ADC) connected to the amplifier (see fig. 2, numbers 230a, 230b, 230c, col. 4, lines 56-67, col. 5, lines 1-8); determining at least a candidate power according to root-mean-square (RMS) powers of a first group of symbols received at the receiver antennas with a processor connected to the ADC (col. 6, lines 8--46); and Chang teaches setting the gain of the amplifier according to a selected candidate power with the processor (fig. 3, numbers 24,30, paragraph 0017).

Patel teaches that " Fig. 1 shows a plot of a multi-carrier (MC) signal that includes three modulated signals centered at the frequencies of f_1, f_2, and f_3 and occupying predetermined bandwidths of BW_1, BW_2, and BW_3, respectively. The three modulated signals occupy a total bandwidth of BW_{RX}. Each modulated signal is generated with its own carrier signal, and the modulated signal is thus also referred to as a "sub-carrier" of the multi-carrier signal." [fig. 1, col. 4, lines 34-41] Patel also teaches that "Fig. 2 shows a simplified block diagram of an embodiment of a receiver 200 for processing the multi-carrier signal shown in Fig. 1. The transmitted signal is received by an antenna 212 .... " and "Filters 222 provides matched filtering for one modulated signal, and has a bandwidth matched to the bandwidth of the particular signal on which it operates," [fig. 2, col. 4, lines 56-67, and col. 5, lines 1-8] meaning that a receiver 200 with a single antenna receives the multi-carrier signal and the front-end unit 216 filters the received multi-carrier into the three sub-carriers corresponding to the three modulated signals. And then, each of the three sub-carriers is sent to one of the corresponding matched filter units 220A, 220B, and 220C, respectively, and the adjustable gain of each of the sub-carriers is provided to each of the sub-carriers respectively.

On the other hand, referring to the specification of the present invention, paragraph [0076]~[0086] support the limitation in claim 1 "a method for automatic gain control (AGC) in a receiver of a multiple-antenna system comprising a plurality of modules having a plurality of receiver antennas for substantially simultaneously receiving a plurality of signals via a single frequency band, the method comprising: amplifying the

plurality of received signals with at least an amplifier; generating a plurality of time domain samples of the amplified signals with at least an analog-to-digital converter (ADC) connected to the amplifier." And Paragraph [0087]~[0092] and [0096]~[0097] support the limitation in claim 1 "determining at least a candidate power according to root-mean-square (RMS) powers of a first group of symbols received at the receiver antennas with a processor connected to the ADC." In brief, the claimed invention presents a method based on the structure of a multi-antenna system of automatic gain control including measuring RMS powers of a first group of symbols received at each of the receiver antenna , determining candidate powers in different ways, such as RMS calculation, arithmetic mean, and geometric mean, and once all candidate powers being determined, selecting one of the candidate powers according to a predetermined rule, and setting the gain of the receiver amplifiers according to the selected candidate power.

Comparatively, Patel disclosed a method of automatic gain control based on the structure of the receiver, and which is of a single-antenna system. For the structure of the receiver in Patel, the gain of each of the sub-carriers is adjusted and provided respectively according to each of the sub-carriers. Therefore, it is the Applicant's position that Patel fails to teach or make obvious the explicitly claimed limitations of "[a] method for automatic gain control (AGC) in a receiver of **a multiple-antenna system** comprising a plurality of modules **having a plurality of receiver antennas**" and "determining at least a candidate power according to root-mean-square (RMS) powers of **a first group of symbols received at the receiver antennas**" (emphases added), since throughout the entirely of the detailed descriptions of Patel as well as its accompanying drawings, nothing more than a single antenna system having only one antenna for receiving RF signals has ever been disclosed. In conclusion, the method based on the structure of the receiver of a single-antenna system cannot achieve the limitation as claim 1 of the present invention based on the structure of a receiver of multi-antenna system.

Chang disclosed a typical receiver which "accomplishes the function of automatic

gain control (AGC) 28 by sending a regulation signal 30 to regulate the power gain of the amplifier 24, so that the received signal energy is made to be approximately constant for subsequent processing." [fig. 3, paragraph [0017]]

Referring to the specification of the present invention, paragraph [0093]~[0095] support the limitation in claim 1 "setting the gain of the amplifier according to a selected candidate power with the processor."

However, Chang fails to teach the limitation in claim 1 of the present invention, **"setting the gain of the amplifier according to a selected candidate power with the processor."** More specifically, Chang fails to teach controlling the gain according to a selected candidate power.

Above all, Patel fails to teach at least "a method for automatic gain control (AGC) in **a receiver of a multiple-antenna system**". And Chang fails to teach at least **"setting the gain of the amplifier according to a selected candidate power with the processor."**

Upon the arguments mentioned above, the applicant believes that the disclosure of Patel combining Chang does not support the rejection under 35 U.S.C. 103 (a) here because "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 - §2143.03 for decisions pertinent to each of

these criteria." [MPEP **2142 Legal Concept of *Prima Facie* Obviousness**] More specifically, the prior art reference (or references when combined) fails to teach or suggest all the claim limitations.

Claims 18 and 19

As claims 18 and 19 are dependent on claims 1 respectively and should be allowed if claims 1 is found allowable, applicants believe newly entered claims 18 and 19 have been placed in position for allowance.

Claims 2-17

As claims 2-17 are dependent on claims 1 respectively and should be allowed if claims 1 is found allowable, applicants believe newly entered claims 2-17 have been placed in position for allowance.

New Claims

Claim 20 is a method claim newly presented. The applicants believe that claim 20 is placed in a position for allowance for Patel fails to teach the claimed limitations of "[a] method for automatic gain control (AGC) in **a receiver of a multiple-antenna system**, the method comprising: receiving a first signal by **a first antenna**; receiving a second signal by **a second antenna**", and which explicitly recites that the receiver utilized in claim 20 is of a multiple-antenna system with at least a first antenna and a second antenna.

Claim 21 is a method claim dependent on claim 20 and should be found allowable if Claim 20 is found allowable.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Sincerely yours,

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